AMENDMENT TO THE CLAIMS

1. (original) A method of generating an area light source having no interference by scanning, comprising the steps of:

a) horizontally scanning a light beam to generate a horizontal line;

b) vertically scanning the light beam line by line, under the control of a vertical scanning mechanism;

c) repeating above steps a) and b) to form a scanning area having no interference.

2. (currently amended) The method as claimed in claim 1, wherein said step a) comprising the step of:

illuminating a light beam ~~(12)~~ from a light emitter ~~(1)~~ to a rotating polygon mirror ~~(2)~~ rotating at high speed, wherein a reflection surface of each plane mirror (S) at the side of the rotating polygon mirror ~~(2)~~ has a predetermined slope angle with respect to the direction of self-rotating axis ~~(AX2)~~, the light beam reflected from each plane mirror scans a scanning line ~~(11)~~, and when rotating over one plane, next plane mirror (S) scans another line which is moved downward by one line to implement a 2-D scanning area.

3. (currently amended) The method as claimed in claim 2, in said step a):

the rotating polygon mirror ~~(2)~~ rotating at high speed is a symmetric polygon about the center of axis ~~(AX2)~~, each plane

mirror (S) reflects light beams irradiated, reflection surfaces of the adjacent plane mirrors (S) have a slope angle with respect to axial direction each other, the rotating polygon mirror ~~(2)~~ has N (N is a positive even number) plane mirrors (S) at the side of it and these plane mirrors (S) are symmetric about the center of the rotating polygon mirror ~~(2)~~, during scanning, in the 1-(N/2)th plane mirrors (S), the surface of each plane mirror (S) increase a same angle one by one with respect to the direction of the axis ~~(AX2)~~, from the (N/2+1)th plane mirror (S) in the (N/2+1)-N/2 plane mirrors (S), each plane mirror (S) decreases the same angle one by one, the plane mirrors are arranged in symmetric on the left and right, during 1-N/2 plane mirrors (S) of the rotating polygon mirror ~~(2)~~ scanning, each plane mirror (S) rotates over its surface, the scanning line ~~(11)~~ moves an angle, and the scanning line ~~(11)~~ moves downward by a line corresponding to the angle, when rotating over the N/2th surface, the scanning line ~~(11)~~ moves downward by N/2 lines in total, from the (N/2+1)th line, every time rotating over one plane mirror (S), the scanning line ~~11~~ moves upward one line until the Nth line, the rotating polygon mirror ~~(2)~~ rotates each circle to complete scanning up and down reciprocately one time.

4. (currently amended) The method as claimed in claim 3, overlapping degree of two adjacent scanning lines ~~(11)~~ depends on the distance between the rotating polygon mirror ~~(2)~~ and a screen

~~(10)~~, and on the size of cross section of scanning beam, and also on the size of slope angle of the surface of each plane mirror (S).

5. (currently amended) The method as claimed in claim 1, wherein said step a) comprising the steps of:

illuminating a light beam emitted from a light emitter ~~(1)~~ onto a horizontal rotating polygon mirror ~~(3)~~, and rotating the horizontal rotating polygon mirror ~~(3)~~ around a rotating axis ~~(AX3)~~ to scan the light beam into a scanning line and;

projecting the light beam onto a vertical rotating polygon mirror ~~(4)~~, rotating the vertical rotating polygon mirror ~~(4)~~ rotates around a rotating axis ~~(AX4)~~ to enabling the laser beam form a 2D scanning area, which is projected onto a 2-D spatial light modulator ~~(8)~~.

6. (currently amended) The method as claimed in claim 5, wherein comprising the step of:

projecting an image from the 2-D spatial light modulator ~~(8)~~ onto a screen ~~(10)~~ via a lens ~~(9)~~ so as to obtain an image through illuminating the 2-D spatial light modulator by using a scanning area light source.

7. (currently amended) The method as claimed in claim 1, wherein said step a) comprising the steps of:

illuminating a light beam emitted from a light emitter ~~(1)~~ onto a horizontal rotating polygon mirror ~~(3)~~, rotating the horizontal rotating polygon mirror ~~(3)~~ around a rotating axis ~~(AX3)~~ to scan the light beam into a scanning line and;

projecting the light beam onto a Galvanometric mirror ~~(5)~~, vibrating the Galvanometirc mirror ~~(5)~~ around a rotating axis ~~(AX5)~~ up and down, and enabling the light beam form a 2D scanning area, which is projected onto an 2-D spatial light modulator ~~(8)~~.

8. (currently amended) The method as claimed in claim 7, wherein further comprising the step of:

projecting an image from the 2-D spatial light modulator ~~(8)~~ onto a screen ~~(10)~~ via a lens ~~(9)~~ so as to obtain an image through illuminating the 2-D spatial light modulator by using a scanning area light source.

9. (currently amended) The method as claimed in claim 1, wherein said step a) comprising the steps of:

projecting a laser beam emitted from a light emitter ~~(1)~~ into a piezoelectric tip/tilt platform mirror ~~(7)~~, driving piezoelectric crystal by the piezoelectric tip/tilt platform mirror ~~(7)~~ to generate angle changes based on a control signal, scanning the light beam in a 2D deflecting mode; and

illuminating the light beams scanned in the 2-D deflecting mode onto a 2-D spatial light modulator ~~(8)~~.

10. (currently amended) The method as claimed in claim 9, wherein further comprising the step of:

projecting an image from the 2-D spatial light modulator ~~(8)~~ onto a projection screen ~~(10)~~ via a lens ~~(9)~~ so as to obtain an image through illuminating the 2-D spatial light modulator by using a scanning area light source.

11. (currently amended) The method as claimed in claim 1, wherein said step a) comprising the steps of:

projecting a laser beam emitted from a light emitter ~~(1)~~ into an acoustic light modulator ~~(7')~~, driving the acoustic light modulator ~~(7')~~ by an control signal to generate angle changes, scanning the light beam in a 2D deflecting mode, and

illuminating the light beam scanned in the 2-D deflecting mode onto a 2-D spatial light modulator ~~(8)~~.

12. (currently amended) The method as claimed in claim 11, wherein further comprising the step of:

projecting an image from the 2-D spatial light modulator ~~(8)~~ onto a screen ~~(10)~~ via a lens ~~(9)~~ so as to obtain an image through illuminating the 2-D spatial light modulator by using a scanning area light source.

13. (currently amended) The method as claimed in claim 1, wherein said step a) comprising the step of:

projecting a laser beam emitted from a light emitter ~~(1)~~ into an electric light modulator ~~(7'')~~, driving the electric light modulator ~~(7'')~~ by an control signal to generate angle changes, scanning the light beam in a 2D deflecting mode, and;

illuminating the light beam scanned in the 2-D deflecting mode onto a 2-D spatial light modulator ~~(8)~~.

14. (currently amended) The method as claimed in claim 13, wherein further comprising the step of:

projecting an image from the 2-D spatial light modulator ~~(8)~~ onto a screen ~~(10)~~ via a lens ~~(9)~~ so as to obtain an image through illuminating the 2-D spatial light modulator by using a scanning area light source.

15. A scanning area light source, comprising of a light emitter ~~(1)~~ and a rotating polygon mirror ~~(2)~~, wherein,

said light emitter ~~(1)~~ is used for emitting a light beam and projecting it onto said rotating polygon ~~(2)~~;

said rotating polygon mirror ~~(2)~~ is used for horizontally scanning the light beam to generate a horizontal line, vertically scanning the light beam line by line, and repeating above 2-D scanning to form an uniform scanning area having no interference.

16. (currently amended) The scanning area light source as claimed in claim 15, wherein a reflection surface of each plane mirror

(S) at the side of the rotating polygon mirror ~~(2)~~ has a slope angle with respect to the direction of self-rotating axis ~~(AX2)~~, a beam reflected from each plane mirror scans a line ~~(11)~~, and when rotating over one plane next plane mirror (S) scans another line which is moved downward by one line to implement a 2-D scanning area.

17. (currently amended) The scanning area light source as claimed in claim 16, wherein said rotating polygon mirror ~~(2)~~ rotating at high speed is a symmetric polygon about the center of axis ~~(AX2)~~, each plane mirror (S) reflects light beams irradiated, reflection surfaces of the adjacent plane mirrors (S) have a slope angle with respect to axial direction each other.

18. (currently amended) The scanning area light source as claimed in claim 17, wherein the rotating polygon mirror ~~(2)~~ has N (N is a positive even number) plane mirrors (S) at the side of it and these plane mirrors (S) are symmetric about the center of the rotating polygon mirror ~~(2)~~, during scanning, in the 1- $(N/2)^{th}$ plane mirrors (S), the surface of each plane mirror (S) increase a same angle one by one with respect to the direction of the axis ~~(AX2)~~, from the $(N/2+1)^{th}$ plane mirror (S) in the (N/2+1)-N/2 plane mirrors (S), each plane mirror (S) decreases the same angle one by one, the plane mirrors are arranged in symmetric on the left and right, during 1-N/2 plane mirrors (S) of the rotating

polygon mirror ~~(2)~~ scanning, each plane mirror (S) rotates over its surface, the scanning line ~~(11)~~ moves an angle, and the scanning line ~~(11)~~ moves downward by a line corresponding to the angle, when rotating over the $(N/2)^{th}$ surface, the scanning line ~~(11)~~ moves downward by N/2 lines in total, from the $(N/2+1)^{th}$ line, every time rotating over one plane mirror (S), the scanning line ~~(11)~~ moves upward one line until the N^{th} line, the rotating polygon mirror ~~(2)~~ rotates each circle to complete scanning up and down reciprocately one time.

19. (currently amended) The scanning area light source as claimed in ~~any one of claims~~claim 16~~, 17 and 18~~, wherein overlapping degree of two adjacent scanning lines ~~(11)~~ depends on the distance between the rotating polygon mirror ~~(2)~~ and a screen ~~(10)~~, and on the size of cross section of scanning beam, and also on the size of slope angle of the surface of each plane mirror (S).

20. (currently amended) A light projection television using a scanning area light source, comprising an area light source unit, an image combination unit and an image unit, wherein

the area light source unit is used for projecting three light beams of R, G and B onto a rotating polygon mirror ~~(2)~~ rotating at high speed, rotating polygon mirror ~~(2)~~ is used for horizontally scanning the light beam to generate a horizontal

line, vertically scanning the light beam line by line, repeating above 2-D scanning so as to transforming three light beams into an uniform scanning area having no interference and refreshing with a predetermined field frequency, and illuminating three spatial light modulators of R, G and B;

the image combination unit is used for combining three monochromatic images into a color image, wherein three spatial light modulators illuminated by

three monochromatic light beams of R, G and B form three channel monochromatic images, which are combined in a combination prism to generate a color image;

the imaging unit is used for projecting the color image from the combination prism on a screen via an objective lens by taking the color image as an object of the objective lens.

21. (currently amended) The light projection television as claimed in claim 20, wherein

said area light source unit comprises a red light emitter~~ (1-R)~~, a green light emitter~~ (1-G)~~, a blue light emitter~~ (1-B)~~, a rotating polygon mirror~~ (2)~~, a central rotation axis ~~(AX2)~~ of the rotating polygon mirror, plane mirrors S at the side of the rotating polygon mirror ~~(2)~~ and mirrors~~ (13-R) and (13-B)~~.

22. (currently amended) The light projection television as claimed in claim 20, wherein said image combination unit

comprises a red channel 2-D spatial light modulator ~~(8-R)~~, a green channel 2-D spatial light modulator ~~(8-G)~~, a blue channel 2-D spatial light modulator ~~(8-B)~~ and a combination prism ~~(14)~~.

23. (currently amended) The light projection television as claimed in claim 20, wherein said imaging unit comprises a projection objective ~~(9)~~ and a screen ~~(10)~~.

24. (currently amended) The light projection television as claimed in claim 21, wherein said rotating polygon mirror ~~(2)~~ is arranged properly in the path constituted of the green channel spatial light modulator ~~(8-G)~~, the combination prism ~~(14)~~ and the projection objective ~~(9)~~, and can rotate about its own rotation axis ~~(AX2)~~, three light beams emitted from the red light emitter ~~(1-R)~~, the green light emitter ~~(1-G)~~ and the blue light emitter ~~(1-B)~~ irradiate onto the same plane mirror (S) of the rotating polygon mirror ~~(2)~~, and then reflected back from the surface, the mirror ~~(13-R)~~ is arranged in the path of red light beam from the red light emitter ~~(1-R)~~, the optical axis of beam reflected from the mirror ~~(13-R)~~ points to the center of the red channel 2-D spatial light modulator ~~(8-R)~~, the aperture area of beam reflected from the mirror ~~(13-R)~~ occupies the operating area of the red channel 2-D spatial light modulator ~~(8-R)~~, the mirror ~~(13-B)~~ is arranged in reflecting blue light path of the blue light emitter ~~(1-B)~~, the optical axis of the beam of the blue

channel 2-D spatial light modulator ~~8-B~~ and the aperture area of beam reflected from the plane mirror ~~(13-B)~~ occupies the operating area of the blue channel 2-D spatial light modulator ~~(8-B)~~, a green beam emitted directly from the plane mirror (S) of the rotating polygon mirror ~~(2)~~ to the green channel 2-D spatial light modulator ~~(8-G)~~ and aperture area of the green beam reflected from the plane mirror occupies operating area of the green channel 2-D spatial light modulator ~~(8-G)~~, three operating areas of the red channel 2-D spatial light modulator ~~(8-R)~~, the green channel 2-D spatial light modulator ~~(8-G)~~ and the blue channel 2-D spatial light modulator ~~(8-B)~~ are parallel to the corresponding operating areas of the combination prism ~~(14)~~.

25. (currently amended) The light projection television as claimed in claim 23, wherein said screen ~~(10)~~ is arranged on the image plane of the projection objective ~~(9)~~, the object plane of the projection objective coincides with exiting beam combined by the combination prism ~~(14)~~.

26. (currently amended) The light projection television as claimed in claim 24, wherein each plane mirror (S) at the side of the rotating polygon mirror ~~(2)~~ with respect to the direction of rotating axis ~~(AX2)~~ makes a slope angle, the slope angles of the plane mirrors (S) corresponding to two ends of the diameters of the rotating polygon mirror ~~2~~ are distributed uniformly in equal difference, the slope angle made by the surface of the first plane mirror (S) at the side of the rotating polygon mirror ~~2~~ with respect to the direction of the rotating axis ~~(AX2)~~ equals

to zero, the diameter of the rotating polygon mirror ~~(2)~~ through axis center of the rotating axis ~~AX2~~ is perpendicular to the plane mirror (S) and pass through the center of the plane mirror, the diameter of the rotating polygon mirror ~~(2)~~ are divided into the left and right parts which are symmetric each other about the diameter of the rotating polygon mirror ~~(2)~~, and the plane mirrors (S) at the left and right sides of the rotating polygon mirror ~~(2)~~ are symmetric about the diameter, the plane mirrors of the rotating polygon mirror ~~(2)~~ are arranged in equal angle difference of the slope angles of the adjacent plane mirrors with respect to the direction of the rotating axis ~~(AX2)~~, the number of the plane mirrors at the side of the rotating polygon mirror is even, N plane mirrors (S) are assumed and arranged clockwise from the first surface and then the slope angle of the first surface equals to zero, the slope angles of adjacent surfaces of two plane mirrors (S) from the second surface to the $(N/2)^{th}$ surface increase the same angle value progressively in turn, the slope angles of adjacent two surface of two plane mirrors from the $(N/2+1)^{th}$ surface to the $(N-1)^{th}$ surface decrease the same angle value progressively in turn.